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Needs Assessment of Child Malnutrition in Bolivia

A Project Presented to
the Faculty of the Undergraduate
College of Health and Behavioral Studies
James Madison University

in Partial Fulfillment of the Requirements
for the Degree of Bachelor of Science

by
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May 2014

Accepted by the faculty of the Department of Health Sciences, James Madison University, in partial fulfillment of the requirements for the Degree of Bachelor of Science.

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DEDICATION

Dedicated to God, my Rock, strength, and source of inspiration to do all things with excellence.

To my parents, my pillars of strength when I am weak, for your unconditional love, for standing by me through the ups and downs, for giving me wings to fly, for helping me see the truth and teaching me that I can do all things through Him who strengthens me, to you I dedicate this work.

In loving memory of all children in the world who have passed away due to malnutrition, to you I dedicate this work. May your suffering not be in vain; may my generation prevent this from happening again.

TABLE OF CONTENTS

TITLE PAGE.....	1
DEDICATION.....	2
TABLE OF CONTENTS.....	3
LIST OF TABLES.....	4
ACKNOLEDGEMENTS.....	5
ABSTRACT.....	7
TEXT.....	9
CHAPTER ONE: Introduction.....	9
CHAPTER TWO: Review Of Literature	14
CHAPTER THREE: Methodology	30
CHAPTER FOUR: Results.....	33
CHAPTER FIVE: Discussion and Conclusion.....	54
APPENDICES.....	67
APPENDIX A: Institutional Review Board (IRB) Approval	67
APPENDIX B: Survey Questions.....	69
BIBLIOGRAPHY.....	70

LIST OF TABLES

Table 1: Eating patterns of families in Bolivia by income.

Table 2: Location in Bolivia where most malnourished children live.

Table 3: Factors that contribute to malnutrition in Bolivia.

Table 4: Factors that contribute to malnutrition in Bolivia with a contrast between Group One and Group Two.

Table 5: Actions of health professionals to help address child malnutrition.

ACKNOWLEDGEMENTS

Certainly, without the financial, technical, and moral support and contribution of many individuals and institutions, I would not have successfully completed this project. First, of all I am grateful for the financial support from the Honors Program at James Madison University, through its Service/Leadership Hillcrest Scholarship. Thank you for investing in my life and for expanding my worldview by providing the means to accomplish this global health internship and research in La Paz, Bolivia.

In addition, I would like to acknowledge Child Family Health International for allowing me to participate in its Pediatric and Adolescent Medicine Program and for providing the participants for this study. Through its homestay families, doctors, medical directors, families of patients, and staff, CFHI has changed my life as a future physician. CFHI facilitated this project, which was instrumental in not only showing me the complexities of addressing malnutrition, but also in providing insight about the role that physicians play as educators in addition to their responsibilities in medicine. Observing how CFHI physicians help increase awareness of health while providing compassionate and patient-centered care with the few resources they have, inspired me. Observing the physicians play the role of educators, counselors, mothers, fathers, physicians, confidants, therapists, psychologists, and friends for their patients and knowing that they sacrifice so much of themselves, reminded me of my future duty to provide holistic health care to my future patients.

I am grateful with each doctor or “doctora” who took their time to educate me on the holistic practice of medicine. They have changed my life forever and inspired me through their commitment to their job. I am grateful for having had the privilege to be their alumna as they invested in my future as the new generation of physicians.

In spite of its majestic sceneries, what I will always value the most about Bolivia is its loving people. My gratitude goes out to all the people that I met in Bolivia and that opened their doors and their hearts to me. They made this trip the learning experience that it was. Thank you for always being so genuine and eager to welcome foreigners with warmth.

Finally, I am grateful with my research advisor, Dr. Wessel, and readers, Dr. Akers and Dr. Enyeart Smith, for all their support, patience, and valuable input on this project. I am grateful for my reach advisor, Dr. Wessel, who patiently guided me through this process and taught me about the basics of qualitative health sciences research and its complexities. I am thankful for all her support and for patiently guiding me each step of way, teaching me to be flexible when encountering the unexpected. Thank you for playing an important role in this milestone of my life.

ABSTRACT

The World Health Organization reports that severe acute malnutrition, one of the leading causes of death in the developing world, is not stressed enough on the international agenda, and few countries, have specific comprehensive policies to address it (World Health Organization [WHO], 2007). According to the Central Intelligence Agency (2013), Bolivia, is affected by severe acute malnutrition and is classified as the poorest nation in South America. La Paz, the seat of government, faces poverty, malnutrition, poor sanitation, and poor access to healthcare for impoverished people. The USA non-profit organization Child Family Health International (CFHI) in La Paz, has created a sustainable source of medical care for children in resource-poor settings.

The purpose of this study was to conduct a needs assessment of child malnutrition in La Paz, Bolivia. The objectives of the research were: to determine the eating patterns of families by income, determine where most malnourished children live, and what major factors contribute to malnutrition in these regions; to determine what has been done by CFHI to address child malnutrition; to determine resources are available to malnourished children and the effectiveness of previous and current methods used; and to determine what can be done in the future.

Data were collected through interviews with 16 adults in La Paz or El Alto connected with CFHI including health care providers, staff, parents, homestay families, and partnering NGOs' staff. Participants answered questions about their nutritional habits and knowledge of resources and programs pertaining to child malnutrition. They were interviewed in person between July 5 and August 5, 2013.

Results indicated professionals were focused on long-term solutions to child malnutrition emphasizing on education, while impoverished families focused on immediate everyday needs.

All participants agreed on the importance of addressing severe acute malnutrition in the children of Bolivia.

I. CHAPTER 1: INTRODUCTION

This chapter introduces the problem of child malnutrition in developing countries, highlights the significance of the problem, introduces the research questions and limitations, and defines terminology associated with child malnutrition.

Introduction

In developing countries, high levels of child malnutrition contribute to mortality and have long-term consequences for children's cognitive development and success in adulthood (World Bank, 2010). According to the World Health Organization (WHO), malnutrition is the leading cause of approximately one third of the nearly eight million deaths in children under five years of age, worldwide (WHO, 2013). According to the United Nations Development Programme (UNDP), poverty rates have significantly declined between 1990 and 2010, but 1.2 million people in the world still live in extreme poverty (2013). Despite major global progress, one in eight people still go to bed hungry; nearly one in six children under age five are underweight, and one in four have stunted or delayed growth (UNDP, 2013). Numerous studies have shown that malnourished children are more susceptible to illness. Malnourished children have increased risk of premature death, and malnourishment may cause a delay in cognitive outcomes and hinder a productive life as an adult (World Bank, 2010).

Unfortunately, progress in reducing childhood malnutrition in developing countries has been slow. More than half of these developing countries are not on track to achieve the Millennium Development Goal established by the United Nations Development Programme of halving the share of the children who are malnourished by 2015 (World Bank, 2010). Financial

crises, political turmoil, natural disasters, and other contributing factors make it hard for developing nations to achieve these goals.

As seen by this study, there is no simple answer to the question “what works to address child malnutrition?” Many interventions that are effective in some countries or cities do not have the same effects when implemented in different locations. Thus, when approaching studies on child malnutrition in the developing world one cannot simply ask “what works”, but rather one should ask, “under what conditions does it work, for whom, which aspects of the intervention work and for how much” (World Bank, 2010, p. x). Although there is no simple solution to the problem, addressing the issue from a multifaceted perspective will allow room for improvement and progress.

Objectives/Research questions

The purpose of this study was to conduct an abbreviated needs assessment of child malnutrition and resources available to stakeholders having connections to Child Family Health International’s Pediatric and Adolescent Medicine Program in La Paz, Bolivia. The following were the four objectives analyzed within the current study:

- 1) Determine the eating patterns of families by income; determine where most malnourished children live; and determine what major factors contribute to child malnutrition in these regions of Bolivia.
- 2) Determine what has been done by CFHI to address child malnutrition in Bolivia.

- 3) Determine what resources are available to children with malnutrition in Bolivia and determine the effectiveness of these previous and current methods used to address child malnutrition in Bolivia.
- 4) Determine what can be done in the future to address child malnutrition.

Limitations of the Study

The study was limited by the data collected through self-report and the accuracy of the information provided by those who volunteered to participate in the interviews. For example, some participants may have been embarrassed if they did not feel knowledgeable about the subject or fearful they did not have “correct” answers. Some participants may have been concerned that the questions about child malnutrition and the efforts to address it reflected badly on them or their agency. Some participants may have been concerned that they would be judged on their efforts or they may have been fearful that someone else other than the interviewer heard their responses when being interviewed.

Definition of terms

1. **Anthropometric outcomes** - weight, height, and birth weight (World Bank, 2010)
2. **CFHI** - Child Family Health International, an NGO in Special Consultative Status with the Economic and Social Council (ECOSOC) of the United Nations, which provides community-based Global Health Education Programs for health science students and institutions. CFHI empowers local communities and fosters reciprocal partnerships to transform perspectives about health and global citizenship (CFHI, 2014).
3. **Developing country** - According to the International Statistical Institute (ISI), a developing country is defined according to its Gross National Income (GNI) per capita

per year. The World Bank states that countries with a GNI of \$11,905 USD and less are defined as developing (International Statistical Institute [ISI], 2014).

4. **Hunger** - a chronic lack of adequate food to meet normal need (Merson, Black, & Mills, 2001); the physiological craving for food or the progressive discomfort, illness and pain resulting from the lack of food (Sizer & Whitney, 2008).
5. **Kwashiorkor** - a type of protein-energy malnutrition (PEM) with mainly protein deficiency and with edema (Fahey, Insel, & Roth 2013).
6. **Malnutrition** - a general term that refers to both undernutrition and overnutrition and can be defined as the insufficient, excessive, or imbalanced consumption of nutrients leading to inadequate amount of calories and proteins required for growth (Sharma & Atri, 2010).
7. **Marasmus** - a type of PEM with mainly energy deficiency and no edema (Fahey, Insel, & Roth 2013).
8. **NGO** - (nongovernmental organization) a voluntary group of individuals or organizations, usually not affiliated with any government that is formed to provide services of advocate public policy. Some are created or controlled by the government. Issues addressed by NGOs include human rights, environmental protection, disaster relief, and developmental assistance. NGOs can be local, national, or international and can be financed by private donations, international organizations, governments, or a combination of these (Encyclopedia Britannica, 2014).
9. **Protein-energy malnutrition (PEM)** - a type of undernutrition and a general lack of food usually seen in young children in poor communities of developing countries. PEM is classified into two forms: marasmus and kwashiorkor (Sharma & Atri, 2010).

- 10. Ready-to-use therapeutic food (RUTF)** - a soft, crushable nutrient and energy-dense food that can be eaten by children more than six months of age without adding water, thereby minimizing the risk of bacterial infections. It usually contains peanut butter, dried skim milk, vitamins, and minerals. It provides nutrients needed for full recovery from severe acute malnutrition. It has a longer shelf life and can be stored for 15 weeks without any refrigeration, even at tropical temperatures (Sharma & Atri, 2010).
- 11. Severe acute malnutrition** - a very low weight for height (below -3z scores of the median WHO growth standards), expressed by visible severe wasting, or by the presence of nutritional oedema (WHO, 2007).
- 12. Stunted** - low height for age (World Bank, 2010).
- 13. Undernutrition** - the a result of a diet that is chronically inadequate in protein, energy, and essential micronutrients and typically manifested in the form of wasting, stunting, and micronutrient deficiency and is often linked with poverty, hunger, and deprivation (Merson, Black, & Mills, 2001).
- 14. Underweight** - low weight for age (World Bank, 2010).
- 15. Wasted** - low weight for height (World Bank, 2010).

II . CHAPTER TWO: REVIEW OF LITERATURE

This chapter reviews the literature on child malnutrition and focuses on nutritional issues in the international context, specifically in Bolivia. The chapter is subdivided into four parts: malnutrition, child malnutrition in developing nations, child malnutrition in Bolivia, strategies to address child malnutrition in developing nations, and strategies to address malnutrition in Bolivia. This chapter will focus on child malnutrition, and specifically it will focus more on the undernutrition aspect of malnutrition, rather than overnutrition.

A. MALNUTRITION

Malnutrition is a general term that refers to both undernutrition and overnutrition and can be defined as the insufficient, excessive, or imbalanced consumption of nutrients leading to inadequate amount of calories and proteins required for growth (Sizer & Whitney, 2008).

Malnutrition is the underlying cause of child mortality that contributes to 34.5 to 52.5% of 10.5 million deaths globally in children under five (World Bank, 2008). According to the WHO, malnutrition is the severest single threat to global public health (Sharma & Atri, 2010).

Globally, people who are at higher risk of malnutrition include individuals who are socially isolated, people with low incomes, growing fetuses, infants, and preschoolers (Shanklin, 2000).

Undernutrition

Undernutrition occurs as a result of a diet that is chronically inadequate in protein, energy, and essential micronutrients (Sizer & Whitney, 2008). An unbalanced diet, lacking proper portions from each food group, can lead to malnutrition (Sharma & Atri, 2010).

Undernutrition is typically manifested in the form of wasting, stunting, and micronutrient deficiency and is often linked with poverty, hunger, and deprivation (Sharma & Atri, 2010).

Extreme forms of undernutrition are present in large parts of South Asia and most of sub-Saharan

Africa, but less extreme forms of undernutrition can be seen in Latin America, North Africa, the Middle East, and Central and East Asia (Sharma & Atri, 2010).

There are three common types of undernutrition, which include protein-energy malnutrition (PEM) and vitamin deficiency disorders, and mineral deficiencies such as iron, and iodine deficiency disorders. First, PEM is a general lack of food as opposed to a deficiency in any one type of vitamin or mineral (Sharma & Atri, 2010). PEM is the most widespread form of undernutrition in the world today (Sizer & Whitney, 2008). PEM occurs when the body's needs for protein and energy cannot be met through diet and is usually seen in young children in poor communities of developing countries (Sizer & Whitney, 2008). PEM is prevalent in developing countries due to inadequate intake of food and is greatly associated with child mortality, impaired physical growth, and impaired social and economic development (Sharma & Atri, 2010).

PEM is classified into two forms: marasmus, which is mainly energy deficiency and no edema, and kwashiorkor, which is mainly protein deficiency with edema (Sharma & Atri, 2010). Marasmus is characterized by muscle wasting, lack of subcutaneous fat, and a typical skin-and-bones appearance (Sharma & Atri, 2010). Usually, a child with marasmus lacks swelling, is very thin, has thin and dry hair, and has sunken cheeks. Complications due to marasmus include gastroenteritis, dehydration, respiratory infections, and eye lesions (Sharma & Atri, 2010).

The second form of PEM, kwashiorkor, was first described in 1935 in West Africa and consists of swelling in the feet, legs, peritoneum (belly area) and the face (Fahey, Insel, & Roth 2013). Most children with kwashiorkor are withdrawn and do not eat. They have skin lesions, which lead to infections. Their hair is usually dry and brittle and loses its normal color (Sharma

& Atri, 2010). Complications of kwashiorkor include gastroenteritis, skin infections, respiratory infections, pulmonary edema, and septicemia (Sharma & Atri, 2010).

A second common type of undernutrition includes vitamin deficiency disorders, which are most common in developing nations. Vitamins are organic carbon containing substances needed in small amounts to help promote and regulate chemical reactions and processes in body cells (Fahey, Insel, & Roth 2013). Common examples of vitamin deficiencies include fat-soluble vitamins such as A, D, E, and K deficiencies. Vitamin A is found in pigmented vegetables and is essential for vision and reducing risk of cancers. Vitamin A deficiency stands as the world's leading cause of blindness in young children, leading to night blindness and xerophthalmia (dry conjunctiva) (Sizer & Whitney, 2008). About three to 20 million children suffer from xerophthalmia each year and between 250,000 and 500,000 go blind due to vitamin A deficiencies (Sharma & Atri, 2010). Vitamin D is synthesized in the skin after exposure to sunlight and deficiency causes severe bone deformities in children (Sizer & Whitney, 2008). In some countries, like the United States, milk is fortified with Vitamin D to provide a dietary source of this vitamin (Sizer & Whitney, 2008). Vitamin E is an antioxidant and plays a big role in the prevention of cancer, coronary heart disease, and cataracts (Sizer & Whitney, 2008). A major food source for Vitamin E is vegetable seed oil (Sizer & Whitney, 2008). A poor diet can lead to deficiency Vitamin E deficiency, which causes neurological defects, abnormal gait (walking), and paralysis or weakness of eye muscles (Sharma & Atri, 2010). Lastly, Vitamin K plays a huge role in blood coagulation and is found in fruits, spinach, and cow's milk. A poor diet can lead to vitamin K deficiency, which can result in prolonged bleeding (Sharma & Atri, 2010).

Other vitamin deficiencies include water-soluble vitamins such as thiamine, riboflavin, niacin, Vitamin B₆, pantothenic acid, Vitamin B₁₂, and Vitamin C deficiency. Thiamin is necessary for carbohydrate oxidation and nerve conduction and can be found in yeast, lean pork, and legumes (Sharma & Atri, 2010). In children, thiamine deficiency leads to beriberi, which is a collection of symptoms including loud piercing cries, difficulty breathing, vomiting, fast heart rate, and enlarged heart (Sharma & Atri, 2010). Riboflavin is mainly found in milk, bread, and pasta (Sharma & Atri, 2010). Deficiency in riboflavin leads to lesions on the mouth, inflammation of the tongue, dermatitis, anemia and weakness (Sharma & Atri, 2010). Niacin is mainly found in cereals, vegetables, and dietary products (Sharma & Atri, 2010). Niacin deficiency leads to pellagra (a combination of dermatitis, diarrhea, and dementia) (Sharma & Atri, 2010). Vitamin B₆ is found in vegetables, legumes, animal products, nuts, fruits, and cereals (Sharma & Atri, 2010). Severe deficiency can lead to anemia, seizures, and diseases of the neurological system (Sharma & Atri, 2010). Pantothenic acid is found in liver, kidney, egg yolk, and broccoli (Sharma & Atri, 2010). Pantothenic acid is important for cell metabolism and protein modification (Sharma & Atri, 2010). Vitamin B₁₂ is found in food items of animal origin and deficiencies lead to anemia, neurological problems, and dementia (Sharma & Atri, 2010). Vitamin C is found in many vegetables, and fresh fruits and deficiencies lead to scurvy (Sharma & Atri, 2010). Scurvy is a problem in many poor countries and causes general weakness, anemia, gum disease, and skin hemorrhages (Sharma & Atri, 2010,).

A third common type of undernutrition includes mineral deficiencies such as iron and iodine deficiency (Fahey, Insel, & Roth 2013). Minerals are inorganic (non-carbon containing compound) needed in small amounts for regulation, growth, and maintenance of body tissues.

Essential trace minerals such as iron and iodine are needed in small amounts (Fahey, Insel, & Roth 2013).

Iron deficiency is a common type of undernutrition. Iron is a key element needed in the metabolism of all living organisms because it helps transport oxygen throughout the blood (Sharma & Atri, 2010). Meat products, legumes, and green leafy vegetables are great sources of iron (Sizer & Whitney, 2008). Iron deficiency is the greatest cause of anemia around the world (Sharma & Atri, 2010). According to the WHO, most preschool children and pregnant women in developing countries and at least 30 to 40% in industrialized countries have iron deficiency (Sharma & Atri, 2010). Iron deficiency can be caused by diet deficiencies. Preventing iron deficiency involves reducing poverty, improved access to diversified diets, health services and sanitation, and better care and feeding practices (Sharma & Atri, 2010,).

Another common type of mineral deficiency is iodine deficiency disorder. Iodine is a trace mineral needed in small amounts (Fahey, Insel, & Roth 2013). Iodine deficiency remains the single greatest cause of preventable brain damage and mental retardation (Sizer & Whitney, 2008). The WHO recommends that the daily intake of iodine should be 90 micrograms for preschool children (0-29 months), 120 micrograms for schoolchildren (6-12 years), 150 micrograms for adults (over 12 years), and 200 micrograms for pregnant and lactating women (Sharma & Atri, 2010). Iodine is found in the ocean and gets washed away from the soil surface by snow and heavy rainfall (Sharma & Atri, 2010). As a result, some of the most iodine deficient areas are the mountainous areas of the world such as the Andes Mountains, in Bolivia (Sharma & Atri, 2010). Deficiencies in iodine can lead to brain damage, and physical, neurological, and intellectual deficits (Sharma & Atri, 2010). It is also associated with neonatal and infant mortality and learning disabilities. In severe cases, iodine deficiencies can lead to

cretinism, an irreversible form of mental retardation, which typically occurs from fetal period to the third month after birth (Sharma & Atri, 2010).

Effects of Malnutrition on Children

Malnutrition during childhood usually results in worse health and lower educational achievements during adulthood (World Bank, 2010). Children who are severely malnourished typically experience slow behavioral development (World Bank, 2010). In addition, the medical literature shows that malnutrition makes children more susceptible to illness and affects child mortality as it increases a child's risk infection because it destroys the body's natural barriers of protection, such as the skin or mucous membranes (World Bank, 2008). These infections lead to weakened bones, which prevent proper growth, causing stunted growth (World Bank, 2008). Beyond the morality risk in the short-run, the developmental delays caused by undernutrition affect children cognitive outcomes and productive potential as adults. In the long-run, undernutrition may lead to impairments in mental function, an unhealthy heart, accumulation of dangerous toxins leading to kidney failure, and a chronically ill immune system (World Bank, 2008).

Nutrition during infancy and early childhood

Mental development is directly related to infant and childhood nutrition. Malnutrition during the earliest stages of postnatal life can cause emotional impairment because it delays the development, growth, and maturation of cells of the central nervous system (Sharma & Atri, 2010). Undernutrition during infancy or early childhood is a major risk for mental retardation (Sharma & Atri, 2010). Most of the medical literature on child malnutrition points to the need of intervening in the first two years of life to prevent child malnutrition and its consequences such

as cognitive impairment (World Bank, 2010). In the life of a child, the period from the womb to the age of about two years is the “window of opportunity” and is critical in term for interventions and investment in order to see greater benefits (World Bank, 2008). Thus, gestation and the first year of life are critical periods of human development.

Mental development is directly related to infant and childhood nutrition. Malnutrition during the earliest stages of postnatal life can cause emotional impairment because it delays the development, growth, and maturation of cells of the central nervous system (Cornelio-Nieto, 2007). Undernutrition, specifically PEM, during infancy or early childhood is a major risk for mental retardation and continues to affect millions of human beings in developing countries (Cornelio-Nieto, 2007). Multiple studies show that malnourished children have important alterations in head circumference and brain growth. In addition, malnutrition is correlated with a decrease in the size of dendritic cells and the amount of myelination in the brain (Cornelio-Nieto, 2007). CAT scans and MRIs in children show images of children who suffer from malnutrition, having cerebral atrophy (Cornelio-Nieto, 2007). Thus, the potential for interventions to prevent malnutrition are greatest during pregnancy and the first 24 months of life (World Bank, 2010).

A. MALNUTRITION IN DEVELOPING COUNTRIES

According to the International Statistical Institute (ISI), a developing country is defined according to its Gross National Income (GNI) per capita per year (International Statistical Institute [ISI], 2014). The World Bank states that countries with a GNI of \$11,905 USD and less are defined as developing (ISI, 2014). In many developing countries, long-term malnutrition is widespread because people do not have enough food to eat. In developing nations, malnutrition is commonly caused by food shortages, poor food prices and distribution, and lack of

breastfeeding (Nordqvist, 2013). Approximately 80 % of malnourished children live in developing nations that actually produce most food surpluses of the world. Famine is linked closely to high food prices and problems with food distribution (Nordqvist, 2013). In developing nations, food shortages are mainly caused by a lack of technology needed for higher yields found in modern agriculture such as such as nitrogen fertilizers, pesticides and irrigation. Food shortages are a significant cause of malnutrition in many parts of the world (Nordqvist, 2013). Lack of breastfeeding occurs to lack of knowledge and proper education (Nordqvist, 2013)

At birth, children in developing countries have similar weight and length as children in well-nourished populations (World Bank, 2010). However, after birth growth patterns differ drastically showing a steady decline in children from developing countries (World Bank, 2010). Children's weight, given their height, begins to decline at age of three months, but eventually recovers to levels only slightly lower than those seen in well-nourished populations (World Bank, 2010). The mean levels of stunting children generally do not recover as the children grow at the same rate as the reference population but are much shorter for their age (World Bank, 2010). Thus, gestation and the first year of life are critical periods of human development. These studies show that there is a correlation between low birth weight and stunting earlier in life and emphasize the importance of intervening early to prevent stunting and its long-term consequences (World Bank, 2010).

B. MALNUTRITION IN BOLIVIA

Among the developing nations affected by malnutrition is Bolivia, which is considered the poorest nation in South America with highest child mortality rates (CIA, 2013). Bolivia is located in the central region of South America, southwest of Brazil and is politically known as

“The Plurinational State of Bolivia” because of its diversity of cultures including Amerindian populations of the Andean west and the non-indigenous communities of the eastern lowlands (CIA, 2013). Bolivia is the fifth largest country in South America with a population of almost 10 million (Samdup & Schutter, 2011). Bolivia is still amongst the poorest countries of Latin America as 56% of the population lives below the national poverty line, 33% lives in extreme poverty, and 1% survives on less than one US dollar per day (Samdup & Schutter, 2011).

In Bolivia, large populations of children do not have access to health care. Approximately, 59% of the population is indigenous, with 37 different indigenous groups living in the Amazon, Andes, and Oriental Chaco (World Bank, 2004). People who suffer most from malnutrition are mainly found in the western and southern parts of the country, including Potosí, Chuquisaca, Beni, Pando, and especially in the most remote rural communities (World Bank, 2004). The largest indigenous groups affected by malnutrition are the Quechua and the Aymara (World Bank, 2004). All indigenous people are socially excluded, and 64% of indigenous people live in poverty (World Bank, 2004). On average, the general population studies for 7.6 years and indigenous people study on average 3.4 years (Samdup & Schutter, 2011). The adult literacy rate is 13 % overall (Samdup & Schutter, 2011). As with poverty, indigenous and rural populations have higher rates of infant mortality and prevalence of diseases, and lower access to health services. Among children, 28% of indigenous children experience chronic malnutrition compared with 16% of non-indigenous children (Samdup & Schutter, 2011). In 1992, according to data published by the Food and Agriculture Organization of the United Nations (FAO), 24% of the total population was undernourished. By 2007, it rose to 27%, which was approximately 2.5 million people (Samdup & Schutter, 2011).

D. STRATEGIES TO ADDRESS CHILD MALNUTRITION IN DEVELOPING COUNTRIES.

Various strategies have been implemented worldwide by different international organizations to help target and address child malnutrition in developing countries. The United Nations (UN) and the WHO have implemented policies and programs to address child malnutrition. During the Millennium Summit in 2000, the UN established eight international Millennium Development Goals (MDG) (UNDP, 2013). All the countries that were part of the UN at the time partnered to achieve the eight goals by 2015. The first goal was to eradicate extreme poverty and hunger (UNDP, 2013). Another one of the eight MDG was directly related to child health and aimed to reduce the under-five mortality rate by two-thirds by 2015 (Sharma & Atri, 2010).

In 2002, the Global Health Strategy of Infant and Young Child Feeding was endorsed by the WHO and the executive board of the United Nations Children's Fund (Sharma & Atri, 201). The WHO and the United Nations Children's Fund (UNICEF) came up with recommendations regarding breast feeding and sponsored The Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding to certify breast-milk as the ideal nutrition and contributor to the healthy growth and development of infants (Sharma & Atri, 2010,).

Various recent studies show that malnutrition in children can be managed at the community level using ready-to-use therapeutic foods (RUTF). A RUTF is a home-based treatment for severe acute malnutrition that ensures rapid weight gain in severely malnourished children (Sharma & Atri, 2010). In 2008, the WHO's Department of Child and Adolescent Health and Development developed technical guidelines and materials for infant and young child feeding for vulnerable groups and provided RUTF to developing nations (Sharma & Atri, 2010).

RUTFs have transformed the treatment of severe malnutrition in many developing nations such as Bolivia.

E. STRATEGIES TO ADDRESS CHILD MALNUTRITION IN BOLIVIA

A number of strategies that have been implemented by the government, local organizations, and partnering international organizations to help target and address child malnutrition in Bolivia. These include governmental policies on public health insurance, public health interventions by the World Bank, the National Council for Food and Nutrition (CONAN), the National Human Rights Action Plan, local municipal feeding programs, and the Indigenous Fund for “Bonos” (Samdup & Schutter, 2011).

In 1996, the current public health insurance in Bolivia was first implemented as the *National Maternal and Child Insurance* (Seguro Nacional de Maternidad y Niños—SNMN). This provided primary care for pregnant women and children under the age of five and included 32 interventions (World Bank, 2004). In 1998, the SNMN became the Basic Health Insurance (Seguro Basico de Salud—SBS) as financing increased and the package expanded to 92 interventions, including some aid for the general population financed by national programs (World Bank, 2004). In 2003, the SBS was replaced by the Universal Maternal and Infant Insurance (Seguro Universal Materno Infantil—SUMI), which covered a more comprehensive package of services for pregnant women and children under five years of age and included tertiary care and dental care (World Bank, 2004).

From 1993 to 2004, the World Bank provided finances for the Integrated Child Development Project, an early child development intervention program to improve nutrition. It consisted of an informal, home-based day care center (PIDIs) for children between the ages of

six months and six years in poor families in 34 low-income urban areas (World Bank, 2010). Services included food supplements for malnourished children, access to health care, and early child education (World Bank, 2010). Two or three caregivers per community, usually women, were trained to offer childcare for up to 15 children in their homes, with a grant or loan (World Bank, 2010). Unfortunately, this program had no effect on any anthropometric indicators for children six months to six years old, despite the fact that the program provided meals to the children amounting to 70-100% of their daily needs (World Bank, 2010). By 2003, the World Bank determined that the program was excessively in cost and discontinued it. The family/home-based day care centers practically disappeared and none were absorbed by another ongoing program (World Bank, 2010).

In 2003, the Bolivian government created the National Council for Food and Nutrition (Consejo Nacional de Alimentacion y Nutricion—CONAN) (Sharma & Atri, 2010). The CONAN is funded by countries including Canada, Belgium, France and Spain (PMD-C, 2014). The CONAN is the government institution that implements the human right to food. This Council coordinates participation between public sector institutions and civil society. It promotes the development of the National Food and Nutritional Security, the human right to adequate food and the eradication of malnutrition (PMD-C, 2014). The CONAN is made up of nine ministries which work at the governmental, national, provincial, and municipal levels to implement programs and projects related to food and nutrition (PMD-C, 2014). These nine ministries, including the Ministry of Health and Sports, design and deliver programs that provide access to sufficient food to vulnerable Bolivian populations. One of the largest intervention programs funded by the CONAN is the Zero Malnutrition Program (Desnutricion Cero) program, which seeks to improve nutrition among pregnant women and children under the age of five at 176

municipalities (PMD-C, 2014). Besides programs enforced by the central government, municipalities have launched local initiatives to improve nutrition in their communities through school feeding programs such as El Desayuno Escolar (Sharma & Atri, 2010) funded by the CONAN.

In 2009, the Ministry of Justice of Bolivia established a five-year National Human Rights Action Plan (Plan Nacional De Acción De Derechos Humanos) to “guarantee and promote the fulfillment of State’s obligations with respect to Human Rights.” (Samdup & Schutter, 2011, pp. 26-27). The action plan provided details of all the human rights that the state of Bolivia is responsible for, including the “human right to food security” (derecho a la seguridad alimentaria) (Samdup & Schutter, 2011, pp. 27). In 2010, Bolivia’s National Human Rights Council became responsible for implementing the plan (Samdup & Schutter, 2011).

In 2009, the government of Bolivia imposed the Fondo Indígena, a direct tax on oil and gas to increase funding for indigenous people (Fondo Indígena) (Samdup & Schutter, 2011). This fund supported subsidies or cash vouchers called “bonos” to benefit vulnerable groups, especially indigenous people (Samdup & Schutter, 2011). For example, the Bono Juana Azurduy addressed child malnutrition by providing economic assistance to all pregnant women and women with children under the age of two (Samdup & Schutter, 2011). The World Bank gave Bolivia a 17 million US dollar loan to implement this program (Samdup & Schutter, 2011). Other “bonos”, or subsidies, include subsidies for school fees such as the “Bono Juancito Pinto”. All of these measures have contributed to poverty reduction and as a result, they have had a positive impact on the ability of Bolivians to access adequate food (Samdup & Schutter, 2011).

There are some international nongovernmental organizations (NGOs) that help address child malnutrition in Bolivia. For example, Child Family Health International (CFHI) indirectly

helps address child malnutrition (CFHI, 2014). CFHI is a nonprofit that started in 1992 and is based in San Francisco, California (CFHI, 2014). Their partners in Bolivia benefit directly from program fees for students doing international global health internships in local hospitals (CFHI, 2014). CFHI's mission is to build and strengthen sustainable health care services for underserved communities worldwide (CFHI, 2014). Program fees from CFHI help run Global Health Education Programs and support international partners who host pre-med and medical students from the US (CFHI, 2014). CFHI international channels funds into local economies to aid in preventing shortage of financial means for of healthcare workers from underserved communities (CFHI, 2014). Well over 50% of the CFHI program fees help to compensate doctors, homestay families and local CFHI representatives for their work providing the CFHI experience (CFHI, 2014). This allows these communities to offer more and better healthcare services and nutritional education to impoverished people CFHI contributions are meant to be an additional source of support for communities that have limited financial resources or access to healthcare (CFHI, 2014).

SUMMARY

Malnutrition refers to undernutrition and overnutrition and is defined as improper balance of nutrients and calories required for growth (Sizer & Whitney, 2008). Malnutrition is the leading cause of child mortality (World Bank, 2008). Undernutrition results from a diet chronically inadequate in protein, energy, and essential micronutrients (Sizer & Whitney, 2008). Types of undernutrition include PEM and vitamin, iron, or iodine deficiency disorders (Sharma & Atri, 2010). Two types of PEM are marasmus and kwashiorkor (Sharma & Atri, 2010). Types of vitamin disorders include Vitamin A, D, E, thiamine, riboflavin, niacin, B₆, pantothenic acid,

B₁₂, and C (Sharma & Atri, 2010). Iron deficiency leads to anemia. Iodine deficiencies lead to brain damage (Sharma & Atri, 2010). Malnutrition has negative effects on children, such as slow behavioral development, poor immune systems, weak bones, stunted growth, and cognitive problems such as mental retardation (Fahey, Insel, & Roth 2013). There is a window of opportunity during the first two years of life to prevent child malnutrition and long-term consequences (World Bank, 2010).

In developing countries, long-term malnutrition is common due to lack of food or poverty (Nordqvist, 2013). Food shortages, poor food distributions, and lack of breastfeeding all cause malnutrition in developing countries (Nordqvist, 2013). Gestation and the first year of life are critical periods to target interventions for malnutrition in developing nations (World Bank, 2010).

Bolivia is among the poorest nations of Latin America (CIA, 2013). Many children lack access to health care and suffer from malnutrition, especially indigenous marginalized children or children in rural areas such as people that live in the Andes Mountains and the Oriental Chaco (Samdup & Schutter, 2011). Higher rates of child malnutrition are seen in indigenous people than non-indigenous people (Samdup & Schutter, 2011).

Worldwide, organizations that have addressed child malnutrition have included the UN and the WHO. The UN has made worldwide efforts to eradicate poverty and hunger and reduce child mortality rates through its Millennium Development Goals (UNDP, 2013). The WHO has endorsed the Global Health Strategy of Infant and Young Children and RUTFs to address child malnutrition (Sharma & Atri, 2010).

In Bolivia, various sources have provided interventions to address child malnutrition. In Bolivia, the public health insurance has helped to address child malnutrition and includes the

SNMN, SBS, and SUM (Samdup & Schutter, 2011). The public health insurance has faced problems of cultural barriers of access to its programs for marginalized vulnerable people in poverty (Samdup & Schutter, 2011). Other public health interventions in Bolivia include PIDIs, the CONAN and Desnutricion Cero, National Human Rights Action Plan, school feeding programs, and The Indigenous Fund for “Bonos” (Samdup & Schutter, 2011). Another international NGO that helps children in Bolivia includes CFHI (CFHI, 2014). The medical literature points to the fact that some interventions in Bolivia, such as Desnutricion Cero, have been effective, while others, such as the public health insurance, have room for much improvement (Samdup & Schutter, 2011).

III. CHAPTER 3: METHODOLOGY

Introduction

This chapter discusses the methodology used in this study and provides an explanation of how participants were sampled and interviewed. The chapter explains the procedures, research design, and data analysis.

Participants

This Human Subject Research was approved by James Madison University's Institutional Review Board (IRB) through the Office of Research and Integrity. The research protocol was assigned ID number 14-001 (Appendix A). Participants' privacy was protected, as their names were not included in the results. Questions asked did not deviate from the list of interview questions provided (Appendix B). Participants were informed about the nature of the questions in advance. Subjects had the right to not answer any questions that made them uncomfortable or questions that they wanted to skip for any reason. Community and cultural standards were taken into account when designing the research questions. For example, the interview questions were translated by the researcher who is a native Spanish-speaking person with cultural competence.

Sixteen face-to-face interviews were conducted in La Paz and El Alto, Bolivia from July 5 to August 5, 2013 at hospital, clinics, NGOs, orphanages, and homestays partnering with Child Family Health International's Pediatric and Adolescent Medicine Program in rural and urban settings. Subjects were recruited to participate with consultation and advice from Dr. Cecilia Uribe de Chavez, the Medical Director of the clinical rotation sites of CFHI in La Paz and the Secretary General of the Committee of Adolescents for the Bolivian Society of Pediatrics.

One location of the participant interviews included *Hospital del Niño*, one of the largest and oldest hospitals in Bolivia. Doctors interviewed there included specialists of oncology,

gastroenterology, infectious diseases, pediatric surgery, nephrology, emergency and outpatient care. Doctors and parents of patients were also interviewed at *Los Andes Hospital*, a municipal hospital located in El Alto, which treats a very poor and marginalized population and at *Adolescent Services*, an outpatient clinic that provides integral healthcare services to adolescents. Other partnering NGOs interviewed included *Para Los Niños* at the orphanage *Hogar Jose Soria* and at the headquarters of *Desnutricion Cero*, a multisectorial program implemented by CONAN.

Confidentiality of the results was maintained throughout the study. Names were collected only if the participant consented. Permission was obtained to attribute quotations to subjects within the results of the study. Data was not distributed otherwise. In order to protect confidentiality, the interviews were conducted in a mutually agreed upon location, such as a secluded space where comments were not overheard. If the interviewee did not have a preference of location or did not have a concern about who could hear, they could chose to be interviewed in a public space, such as a doctor's lounge or the waiting room. Adults were asked to state their profession. The adults were made aware of the interview process before they agreed or decline to be a part of the study by signing the consent form.

The researcher retained the right to use and publish non-identifiable data. While individual responses were confidential, aggregate data was presented representing averages, percentages, or generalizations about the responses as a whole. Data was stored electronically on a password protected electronic storing device, which was only accessible by the investigators. The paper copies of the surveys were kept in a locked drawer only available to the investigators. After the research was finalized, all responses were destroyed from the archives.

Procedures

The adults were asked to answer a series of questions related to child malnutrition in Bolivia based on their knowledge of their community and its resources (Appendix A). Participants were asked to sign the consent form prior to the start of the interviews. All of their questions were answered to their satisfaction before beginning the interviews. Written notes were taken during the interview, which was conducted in Spanish. All notes were translated to English and typed. Responses were used as qualitative data to report within the results of the study.

Data Analysis

The data was tabulated according to frequency of the same responses and grouping of similar answers to questions. Since the number of subjects was limited, the responses were tabulated by hand. Common themes that emerged were noted. For example, if the respondents noticed various foods such as rice, potatoes, oatmeal, cereals, etc, they were grouped as “carbohydrates”.

IV. CHAPTER 4: RESULTS

Introduction

The current study was designed to investigate the four objectives and the results are presented in the manner that they assess each objective. In some cases, results were grouped according to the categorization of the participants. Group One responses were from the parents of patients, most who were unemployed, uneducated, usually did not finish high school or middle school, and had lower incomes. Group Two responses were from educated personnel such as doctors, teachers or educators, directors of NGOs, psychologists, and social workers, all who were educated and had higher incomes.

OBJECTIVE ONE: Eating patterns of families by income, areas where most malnourished children live, and major factors that contribute to child malnutrition

Perceptions of child malnutrition

Participants were asked about their knowledge of child malnutrition. Three questions were used as an introduction to the topic of child malnutrition and gain a perspective on nutritional disparities in Bolivia. Objective one investigated eating patterns, location of malnourished children, and factors that contribute to child malnutrition.

Eating patterns of families by income

Participants were asked about their knowledge of eating patterns between different socioeconomic classes in Bolivia. The 16 participants reported more than one response for eating patterns; therefore, the total number of responses in some categories is greater than the total

number of participants (Table 1). Based on the total responses from all participants, 18.75% of low-income families eat smaller variety of meals respectively. Twenty-five percent of high Income families eat a wider variety of meals respectively. Approximately 68.75% of high-income families eat a more balanced meal. Participants also reported that low-income families tend to eat one to three times a day, while middle and high-income families eat three to five times a day.

Approximately 37.5% of respondents also reported that low-income families tend to eat a higher percentage of carbohydrates including oatmeal, rice, noodles, potatoes, cereal, white bread, and chuño (dehydrated potatoes). Participants reported that middle and high-income families tend to eat more proteins, fruits and vegetables, meats, and junk food. Participants reported that more low income families tend to breast feed babies due to lack of food, eat soup as a meal, drink tea as a meal, eat cheaper foods, and eat at home. It was also reported that middle and high-income families tend to eat out at restaurant and high-income families tend to have maids who cook for them at home (Table 1).

Table 1. Eating patterns of families in Bolivia by income

Eating Patterns	Low income		Middle income		High Income		Did not use that term as a response		Total	
	N	%	N	%	N	%	N	%	N	%
Diet predominately high in carbohydrates *	6	37.5	1	6.3	0	0	9	56.3	16	100
A lot of saturated fats	3	18.8	1	6.3	0	0	12	75	16	100
More proteins (eggs)	0	0	3	18.8	2	12.5	11	68.8	16	100
Oatmeal, rice, noodles, potatoes, cereal, white bread , chuño (dehydrated potatoes)	8	50	8	50	0	0	0	0	16	100
Quinoa in soup or as a cereal	1	6.3	2	12.5	0	0	13	81.3	16	100
fruits and vegetables: Carrots, plantains, lentil, zapallo, vainita, cabbage, okra, pito	1	0.1	8	50	2	12.5	5	31.3	16	100
Meats : cow liver, chicken, meats	2	12.5	3	18.8	1	6.25	10	62.5	16	100
Snacks: tea with milk and bread, Jell-O, cereal, yogurt	1	6.3	1	6.3	0	0	14	87.5	16	100
Junk food or fast food	0	0	2	12.5	5	31.25	9	56.3	16	100
Powdered Milk	0	0	1	6.3	0	0	15	93.8	16	100
Processed Pasteurized Milk	0	0	1	6.3	0	0	15	93.8	16	100
Mainly breast milk for baby	1	6.3	0	0	0	0	15	93.8	16	100
Soup as a meal	2	12.5	2	12.5	0	0	12	75	16	100
Tea as a meal (sometimes accompanied with a piece of bread)	4	25	0	0	0	0	12	75	16	100
Cheaper more accessible food such as salteñas	2	12.5	0	0	0	0	12	87.5	16	100
Eat at home	5	31.3	3	18.75	4	25	4	25	16	100
More access to restaurants or expensive food	0	0	2	6.25	7	43	7	43.8	16	100
Have maids who cook for them	0	0	0	0	1	6.25	15	93.8	16	100
*Some participants specifically reported carbohydrates and others named food that can be classified as carbohydrates.										

Location of most malnourished children in Bolivia

Question five provided knowledge on where most malnourished children live in Bolivia. Note that 16 total people were interviewed but each participant listed responses in more than one category. Based on similar response from participants, 37.25% of children with scarcity of food live in the Altiplano of Los Andes Mountains, including the Altiplano of Oruro and the Bolivian Chaco (Table 2).

Table 2. Locations in Bolivia where most malnourished children live

RESPONSES OF PARTICIPANTS	N	%
Altiplano of Los Andes Mountains: Including Altiplano of Oruro, the Bolivian Chaco	6	37.5
El Alto	3	18.8
Every city/region	2	12.5
Potosi	1	6.3
Rural areas (El Campo) far from the city	5	31.2
Street children across the country	2	12.5
Suburbs of La Paz (or peripheral zones of the city)	3	18.8
Not sure/ Did not know	2	12.5
TOTAL	16	150

Factors that contribute to child malnutrition in these regions of Bolivia

Question six provided knowledge on what factors contribute to malnutrition in the children of different regions. The results for this objective are presented in two ways. First, all responses are grouped by similarities between all participants, without differentiating between Group One (parents of patients who are unemployed, uneducated, and have low incomes) and Group Two (educated personnel with higher education higher income). Based on similar response from participants, 81.25% said that education was a factor that is contributing to child malnutrition (Table 3).

Second, responses were grouped by similarities between Group One (parents of patients who are unemployed, uneducated, and have low incomes) and Group Two (educated personnel with higher education and higher income) because there seemed to be a difference between these groups as to what factor most contributes to child malnutrition. Group One reported the lack of money or economic resources (little to no income) as a factor that contributes to child malnutrition (42.9%). Group Two reported more frequently that the lack of education (lack of knowledge on nutrition of food and lack of education to find sustainable jobs) contributed to child malnutrition (Table 4).

Table 3. Factors that contribute to malnutrition in Bolivia

RESPONSES OF ALL PARTICIPANTS	N	%
Abandonment by parents, lack of maternal attention to their babies	2	12.5
Lack of access to health	1	6.3
Lack of access to food	1	6.3
Lack of education (lack of knowledge on nutrition of food and lack of education to find sustainable jobs)	13	81.25
Lack of electricity	3	18.8
Lack of money or economic resources (little to no income due to lack of jobs)	10	62.5
Lack of rich soil for harvesting crops (sometimes caused by global warming)	2	12.5
Lack of water (effects of global warming, and demographics)	3	12.5
Social reasons such as cultural barriers & traditions	2	12.5

Table 4. Factors that contribute to malnutrition in Bolivia with a contrast between Group One (parents of patients who are uneducated, unemployed, and have low income) and Group Two (educated personnel who had higher education and income).

	Group One		Group Two	
RESPONSES OF PARTICIPANTS	N	%	N	%
Abandonment by parents, lack of maternal attention to their babies	1	14.3	1	3.4
Lack of access to health	0	0.0	1	3.4
Lack of access to food	1	14.3	0	0.0
Lack of education (lack of knowledge on nutrition of food and lack of education to find sustainable jobs)	1	14.3	12	41.4
Lack of electricity	0	0.0	1	3.4
Lack of money or economic resources (little to no income due to lack of jobs)	3	42.9	7	24.1
Lack of rich soil for harvesting crops (sometimes caused by global warming)	1	14.3	2	6.9
Lack of water (effects of global warming, and demographics)	0	0.0	3	10.3
Social reasons such as cultural barriers & traditions	0	0.0	2	6.9
Total Responses	7	100.0	29	100.0

OBJECTIVE TWO: Efforts of CFHI to address child malnutrition in Bolivia

Question seven provided knowledge of what has been done by CFHI to address child malnutrition in Bolivia. Of the 16 individuals interviewed, 68.8% said they were not familiar

with any ways in which CFHI helps address child malnutrition. Among the same group, 31.3 % said that they were familiar with ways in which CFHI helps address malnutrition.

Participants said that CFHI helps promote education to parents of the patients in clinics and hospitals that partner with CFHI. For example, doctors reported that student volunteers help educate patients and parents in the waiting room in regards dental hygiene and nutrition. Doctors also reported that CFHI students distribute pamphlets about healthy diets and balanced meals. Participants also reported that some CFHI student volunteers pray for the sick patients and help with emotional and spiritual wellness. Participants said that CFHI helps mainly in short term rather than in long-term ways because its student volunteers are only at the clinical sites for one month. Participants also reported that CFHI sends medical supplies with the student volunteers to the hospitals and that the students have held workshops that the doctors have required parents of the patients to attend.

Participants reported that, currently, CFHI provides honorariums for physicians who work with CFHI students and mainly sends economic help for hospitals. At Hospital del Niño, participants reported that CFHI has donated funds for new cardiology equipment. None of the participants were able to specify how many families benefit from CFHI's efforts.

OBJECTIVE THREE: To determine what resources are available to children with malnutrition in Bolivia and the effectiveness of these previous and current methods used.

Questions eight through 12 helped address this objective. The results for this objective are presented in two parts, results with respect to the following types of resources reported including Government programs and Non-Government programs. Government programs included resources offered by the ministry of health such as programs that offer milk or vitamin

supplements and programs offered by UNICEF. Non-Government programs included resources reported to come from religious groups, international countries, and health care professionals.

1. Government Programs

Question eight of the interview was used to address objective three, to determine what resources are available and how effective these previous and current methods have been. This part represented results that pertained to programs offered by the government including those offered by the ministry of health such as milk and vitamin supplements and other programs offered by UNICEF. Responses were classified into two similar groups of participants: Group One (parents of patients who are unemployed or uneducated) and Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers, etc). Some responses were expanded upon due to the groupings of the participants.

a) Programs offered by the Ministry of Health

Two participants mentioned that state run clinics and hospitals provide Suprelac products, which are nutritious powder for milk shakes. They also provide RUTF called Plumpynut, which are peanut butter or yogurt based nutritious produces for malnourished children. However, group one participants (parents of patients, unemployed, uneducated) also suggested that some hospitals hide the resources or claim that the resources are only for specific regions. Lastly, some participants said that the Ministry of Health runs education campaigns on television that help educate people on nutrition and balanced meals. However, Group One participants (parents of patients, unemployed, uneducated) said that only people who have electricity and a TV could watch these education campaigns.

Participants said that some state run clinics and hospitals give out free dairy products such as milk and yogurt and they offer vitamin supplements and vaccines. However, those

benefiting from these programs must have an identification card through their insurance. When analyzing the differences between the groups, parents of patients (unemployed, uneducated) from Group One said that it is too expensive to buy if you are impoverished. They explained that only people who work in companies have access to insurance every month. A specific program that offers milk and dairy products includes the Seguro Nacional de la Lactancia (National Security of Lactation), which gives women cheese, yogurt, and milk. However, many people do not consume them. Instead, they sell them.

In addition, there are other government programs that offer free ferrous sulfate (iron supplement) pills for pregnant women. Other programs offer Chispitas, which are iron supplements for children. However, parents of patients (unemployed, uneducated) said that there are not enough pills being given to those who need them most. Each package contains 60 pills and they only receive Chispitas once every six months. Other programs offer anthelmintics, which are used to deworm malnourished children. Another program that offers food and milk includes Food for the Hungry. No explanation was given as to how effective this program has been.

b) CONAN, Insurance plans, Bono, AIE-PINU, and UNICEF

Participants said that a main government program that addresses child malnutrition is the CONAN (Consejo Nacional de la Alimentacion y Nutricion, or The National Council for Food and Nutrition). The CONAN has also provided many resources to multiple municipalities through its Desnutricion Cero program. For example, some of the participants reported that the Desnutricion Cero helps at the grass roots level by providing wells for access to water in impoverished places. Participants reported that Desnutricion Cero has helped different districts address basic sanitation and public health issues by providing feeding programs for children.

Participants reported that the Desnutricion Program has trained medical personnel and focused on prevention and diagnosis of malnutrition. In addition, mobilization programs have helped mobilize people to more fertile regions where they can harvest different crops.

Participants reported that the SUMI (Universal Maternal and Child Insurance) addresses child malnutrition by offering free health care (vaccines) and food to impoverished mothers who are pregnant. Participants reported that this covers visits to the pediatrician and that mothers must register to receive their identification card attend prenatal check-ups.

Another government program that helps address child malnutrition reported by the participants was the Nacional Maternal and Child Insurance (SNMN), a subsidized system for pregnant women who cannot work. Participants reported that this insurance plan has provided some participants with nutritious foods from the fifth month of pregnancy until the child is one year of age. Participants explained that this is only for those who are employed or are married to someone who is employed and has insurance. Participants reported that the SNMN also offers milk and food products for a pregnant mothers. Participants reported that other insurance plans they use include the Basic Health Insurance (SBS).

Group One participants (parents of patients, unemployed, uneducated) suggested that most women who are poor and need insurance do not get anything. Participants explained that these women could not get insurance because they are unemployed due to the fact that they are uneducated. Participants suggested that mainly the middle and higher class benefit from insurance plans. Some participants said that they have had to buy these products from family members who do have insurance because their families would sell these products at a more affordable price than other stores. Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers) participants explained how much this

insurance program has helped their families when only one parent has not been able to bring home an income when wives have been pregnant. Participants from Group Two spoke with great enthusiasm about the big baskets of food that have helped provide nourishment to mothers during pregnancy and to feed their newborn.

Moreover, participants said that another program that addresses malnutrition is the Bono Juana Azurduy, which is a subsidized system that offers about 200 Bs (Bolivianos= Bolivian currency) for Bolivian mothers per check-up with a pediatrician. This is a subsidy paid in 17 installments as a stipend for mothers. It is part of the CNS (Caja Nacional de Seguro). This stimulus bonus allows mothers to attend free check-ups. At each check-up, if their child is healthy they get a stamp on a card. At the end of two months, if they have the appropriate amount of stamps, they get 200 Bs. Other stimulus and bonus plans include the Juancito Pinto.

Group One (parents of patients, unemployed, uneducated) participants said that the Bono provides money for diapers and that sometimes it provides mothers with legumes, milk, and quinoa. Other participants in this group suggested that many times they could not afford to get to the sites where these resources were distributed because they do not have enough money for bus fare to take their child to the clinic. Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers) suggested that this program is ineffective because there are too many impoverished women who get pregnant and have more than 10 children. Thus, the government cannot afford to help everyone and they are paying for these programs with their taxes.

Other participants said that the government has implemented the Desayuno Escolar (Free Breakfast snack in public schools) and the AIE PINU (Atencion Integral de Enfermedad Prevalentes de la Infancia or the Integral Attention to Prevalent Sickneses of Infants) to address

child malnutrition. Participants reported that the AIE-PINU treats most prevalent diseases and sickness in the first five years of life. Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers) participants suggested that this program is highly effective to combat malnutrition. Physicians suggested that it has been beneficial for them, as it has created new culturally sensitive charts and laws to change how doctors measure malnutrition (by weight and height not weight and age).

Lastly, Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers) said that UNICEF has helped primarily in orphanages. Leaders of various NGOs explained that more than giving out physical things, UNICEF has worked at a higher level, such as funding programs. UNICEF has also provided many volunteers. Unfortunately, participants suggested that UNICEF has left Bolivia because the current government is leftist. Group One reported to have no knowledge on UNICEF all together and reported that they were not familiar with this organization.

2) Non-Government Programs

Responses to questions nine, 10, 11, and 12 were also used to address objective three, to determine what resources are available and how effective these previous and current methods have been. Non-Government programs that offered resources to address child malnutrition were those reported to come from religious groups, international countries, health care professionals, and other sources.

a) Religious groups

Of the participants interviewed, 31.6% said that they did not know or were not informed about what churches or religious groups are doing to help address child malnutrition.

Approximately 21.1% of the participants said that churches host activities mainly at Christmas. For example, participants reported that churches bring hot chocolate to orphanages or homeless shelters and homeless people on the streets only in special seasons. Approximately 10.5% of the participants reported that some Christian Churches give out rice and sugar to help single mothers. According to 10.5 % of the participants, the Catholic Church, was one of the largest denominations in Bolivia, and has strengthened existing NGOs by providing funds. Participants reported that the Catholic Church has a program called “Caritas” which helps vulnerable groups and works jails and in orphanages. Of those participants interviewed, 10.5% said that some churches give out food or host soup kitchens and 5.3 % said that the Adventist Church helps through its Adventist Development and Relief Agency Program (ADRA). According to 5.3 % of the participants, the Mormon Churches host events for homeless malnourished children and adults. According to 5.3% of the participants, other religious organizations that help address child malnutrition include SAMARITAN’s Purse, Save the Children, CARE, and Food for Humanity. None of the participants specified how effective these programs were.

b) International Countries

Participants mentioned that the following countries have provided resources to help address child malnutrition: Argentina, Canada, Chile, China, Denmark, France, Germany, Holland (Netherlands), Japan, Korea, Norway, Spain, Sweden, United States of America (through USAID). Participants suggested that some of these countries send money to the government, start NGOs or fund NGOs, work in rural areas, or provide vaccines and Chispitas. Participants said these nations have reduced infant mortality rates through vaccinations and nutrition programs. Participants expressed concern that the USA used to help a lot but with the current state of the Bolivian government, many people doubt they will continue helping. Other

participants said that the PAHO/WHO from the Pan-American Health Organization offers vaccines. Respondents said that Bolivia cannot handle the problem of malnutrition on its own, but with the current state of the government, many people believe that international relationships have been hindered. Lastly, approximately 22.6% of the participants said that they did not know what other countries were doing to address child malnutrition.

c) Health care professionals

Responses to questions about the efforts of health care professionals to address child malnutrition were classified into two similar groups of participants: Group One (parents of patients who are unemployed or uneducated) and Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers, etc). Some participants gave responses that corresponded to more than one type of action N>16 (Table 5).

For Group One (parents of patients who were unemployed or uneducated), 11.1 % of participants said that health care professionals have helped provide breastfeeding education to address child malnutrition. For Group One, none of the participants had knowledge about health care professionals that host health fairs and campaigns nationally in public spaces. From Group One, 11.1 % of the participants said that health care professionals have made sure pediatric patients are up to date on vaccines and have promoted government programs. From the participants interviewed in Group One, 56.6 % reported that health care professionals provided nutritional education. From the participants interviewed for Group One, 22.2% said that health care professionals have promoted quinoa (Table 5).

Group One commented that what the doctors told them to eat was unrealistic. Some health care professionals taught mothers to eat vegetables and quinoa, but the participants claimed that it was hard to find inexpensive vegetables that were suggested by doctors. For

example, some pediatric nutritionists asked mothers of the pediatric patients to eat “amaranto”, but some of these impoverished women did not have money to get on a bus to go get that type of vegetable. Some participants said that they did not have easy access to nutritious foods. They claimed they could not obtain certain types of vegetables because they did not have cars and they did not have enough money for bus fare. The participants from Group One reported that the health care professions gave them pamphlets about nutrition and balanced meals but since they could not read, the pamphlets did not help them.

For Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers, etc), 15.8 % of participants said that healthcare professionals helped provide breastfeeding education to address child malnutrition. From Group Two, 21.1% of the participants said that health care professionals host Health Fairs and campaigns nationally in public spaces. Approximately 26.3 % of the participants from Group Two said that health care professionals made sure pediatric patients are up to date on vaccines and promoted government programs. Approximately 31.6 % of the participants from Group Two said that health care professionals provided nutritional education, and 5.3% said that health care professionals promoted quinoa (Table 5).

Comments from Group Two included that health care professionals should enforce nutritious sovereignty and make sure that Bolivian people eat what their country produces and avoid consumption of greasy foods. Some pediatric doctors said that they offered the parents of their patients many healthy choices of nutritional food items based on where they live and what kind of transportation they have, but due to cultural differences, they did not listen.

Table 5. Actions of Health Professionals to help address child malnutrition				
Type of Action	Group 1		Group 2	
	N	%	N	%
Breastfeeding education	1	11.1	3	15.8
Health fairs/ campaigns hosted nationally in public spaces	0	0.0	4	21.1
Make sure pediatric patients are up to date on vaccines and promote government programs	1	11.1	5	26.3
Nutritional education	5	55.6	6	31.6
Promote quinoa	2	22.2	1	5.3
TOTAL	9	100.0	19	100.0

c) Other Types of Programs

Other programs mentioned that have addressed child malnutrition include the Program Mundial de Alimentos de Las Naciones Unidas (The World Program of Food for the United Nations). Private companies such as Pill Andina S.A., a corporate dairy company has given away free milk. The FAO was also mentioned as a program that addresses child malnutrition; however, the resources that they provide were not specified.

OBJECTIVE FOUR: Determine what can be done in the future to address child malnutrition in Bolivia.

Question number 12 was used to address this objective. Responses were classified into two groups of similar participants: Group One (parents of patients who were unemployed or uneducated) and Group Two (educated personnel, doctors, teachers, educators, directors of NGOs, psychologists, social workers, etc). From Group One, 33.3% said that the government

should directly provide more goods or food for people who need it most. Of those participants interviewed in Group One, 50% said that the government should provide daycares for mothers. Approximately 16.7% of participants said improving skills related education, such as trade school or cooking classes for mothers, would help reduce child malnutrition.

Group Two provided the following suggestions for solutions to address child malnutrition in Bolivia. From Group Two, 58.8% of the participants said that basic education should be reformed and made mandatory for all Bolivians, and in addition, schools should teach a component of national education for children and parents. Of those participants interviewed from Group Two, 11.8% suggested that educational campaigns to inform people about nutrition would help reduce child malnutrition. From Group Two, 11.8% of the participants said that traditions would need to be broken in order to reduce child malnutrition. For example, social workers reported that cultural traditions of eating too many potatoes would need to be changed. From Group Two, 5.9% of the participants said that agriculture needed to be improved. In addition, 5.9% of the participants said that addressing problems with the climate and lack of water, such as increasing alternative uses of energy, would help address child malnutrition. Finally, 5.9% said that the government needs to increase funding for preventive programs and not restorative programs.

SUMMMARY

Based on the results for objective one, low income families eat a smaller variety of meals and eat less times a day, usually only at home and cheaper meals. Low-income families tend to eat more carbohydrates and they tend to breast feed their children more and eat soup or drink tea as a meal due to lack of other food. In contrast, middle and higher income families eat a wider variety of meals and eat more times a day. They eat more proteins, fruits, and vegetables that are

accessible. They also can afford to eat out at restaurant more often and usually eat more junk food than the lower income families. High-income families tend to have more maids who cook for them at home too.

Most children who have malnutrition tend to live in the Altiplano of Los Andes Mountains, including the Altiplano of Oruro and the Bolivian Chaco, which are arid and mountainous regions. Group One participants (those who are uneducated and tend to come from impoverished homes) believe that lack of money and economic resources, meaning little to no income, is the main factor that contributes to child malnutrition. Group Two (professionals and educated personnel), believes that lack of education, mainly lack of knowledge on nutrition of food and lack of education to find sustainable jobs, is the main cause of malnutrition in Bolivia.

Based on the results for objective two, most people were not familiar with ways in which CFHI has helped to address child malnutrition in Bolivia. Those participants who were familiar with CFHI reported that this NGO has helped mainly in short-term ways by promoting education at clinics. They also reported that CFHI has helped provide financial means to partnering physicians and providing new medical equipment for hospitals. Other types of resources available include those that come from religious groups, international countries, and health care professionals.

Based on the results for objective three, resources that were available to help address child malnutrition included government programs and non-government programs. Government programs included those offered by the ministry of health, such as those which offered milk or vitamin supplements, Suprelac products, RUTF Plumpynut packages, and educational campaigns on the television, the CONAN, Insurance Plans, the Bono, and the AIE-PINU. Participants reported that some of these programs are not effective because there is no transparency on how

resources are distributed and educational campaigns on television only help those who have televisions and electricity. Group One participants claimed that they have trouble accessing these resources due to lack of insurance, transportation, and jobs. Participants said that impoverished people could not access insurance plans because they cannot get jobs while Group Two participants explained the benefits from their insurance plans. Group One participants are enthusiastic about the Bono subsidized system, while Group Two participants suggest that the program is ineffective and expensive to pay with taxes.

In addition, participants reported that UNICEF helps mainly by funding programs but has currently reduced efforts due to the leftist government in Bolivia. Other resources come from the World Program of Food for the United Nations, Pill Anda S.A. private companies, FOA programs, and mobilization programs.

Non-government programs include those reported to come from religious groups, international countries, and health care professionals. Participants reported that religious groups provide short-term relief efforts. Participants reported that various international countries have helped address child malnutrition in Bolivia but participants are fearful that aid has reduced due to political differences in the current leftist government of Bolivia. Participants reported that health care professionals helped address child malnutrition by implementing government programs and providing nutritional education. Group One participants claimed that they had problems with access to the types of food that doctors told them to eat. Group Two reported that that doctors give as much advice as they can but that some patients chose to not listen.

Based on the results for objective four, the following were ideas presented by participants of what can be done in the future to address child malnutrition. Group One reported that the government should increase short-term interventions that directly provide more goods for them,

such as providing more food and daycares. Group One reported that they need trade schools where citizens can learn a skill to find a job. Group Two participants suggested that Bolivia needed educational reform to improve child malnutrition. Participants also suggested that environmental issues, such as lack of water and other agricultural problems such as lack of fertilizers for farmers in arid areas, needed to be addressed.

IV. CHAPTER 5: DISCUSION AND CONCLUSION

The purpose of this chapter is to provide a discussion and conclusion of the results obtained in the interviews. This section is presented in three parts. The first part is a discussion of the results for each of the four objectives studied. Following this, suggestions for further research and conclusions are provided.

OBJECTIVE ONE: Eating patterns of families by income, areas where most malnourished children live, and major factors that contribute to child malnutrition

Objective number one was successfully attained. In general, most people from group two agreed that low-income families eat a diet that consists primarily of carbohydrates due to lack of education on balanced meals. Countless times physicians explained that low-income families feed their children rice and potato and no vegetables or meats. These children are not eating sufficient amounts of meats, a major and complete source of protein, necessary for structure of bones and muscles (Fahey, Insel, & Roth 2013). The adequate daily intake of proteins for a person should be 0.36 grams per pound of body weight. For example, a child who weighs 50 pounds should consume about 18 grams of protein a day (Sharma & Atri, 2010). Children from low-income families in Bolivia are not receiving proper amounts of complete proteins that supply all the essential amino acids.

Undernutrition can be affected by socioeconomic, biological, and environmental factors (Sharma & Atri, 2010). One of the major socioeconomic factors that cause undernutrition is poverty. People who live in poverty often face challenges such as a lack of access to food, education, water, and transportation, and face overcrowding, unhygienic conditions, and inadequate childcare (Sharma & Atri, 2010). Many of the Bolivian indigenous impoverished

women, who attend clinics at CFHI sites, face all of these challenges. Most of them are not educated on how to feed their children a balanced meal. They also do not have the means to afford meats. For this reason, the doctors said they spend countless hours accommodating their diets based on what foods are accessible to them. For example, the physicians reported that they constantly promote quinoa, which is a grain that is readily available to them and can provide all of the essential amino acids. The government of Bolivia has promoting the intake of quinoa as it has been singled out by the Food and Agricultural Organization of the United Nations (FAO) as a food item with high nutritive value and impressive biodiversity (The George Mateljan Foundation, 2014). According to the FAO, quinoa plays an important role in achieving food security worldwide because it is the only grain that can provide all essential amino acids (The George Mateljan Foundation, 2014).

A second important socioeconomic factor related to malnutrition is lack of knowledge, which may be about weaning practices, types of foods to eat, and feeding practices during illnesses. Improper weaning practices, including inadequate breast-feeding, delayed supplementary feeding, and over dilution of milk are also socioeconomic factors that lead to undernutrition (Sharma & Atri, 2010). Lack of breastfeeding occurs often in developing nations such as Bolivia, leading to malnutrition in infants and children. The pediatricians who participated in this study consistently reminded the women to make sure they breastfed their children. Unfortunately, sometimes the mothers abandon breastfeeding because they do not know how to get their baby to latch on properly or because they experience pain and discomfort while breastfeeding (Nordqvist, 2013). In addition, some of the impoverished Bolivian women do not have enough money to buy whole milk or cow's milk so they give their children rice milk, which is low fat milk made from boiled rice, brown rice syrup, and brown rice starch. Since this

milk is low in fat and protein, this can lead to problems in cognitive development in children, as mainly whole milk is a great source of fat for myelination of axons in the brain.

Third, another socioeconomic factor related to malnutrition may be cultural practices, such as restrictions regarding some food items (Sharma & Atri, 2010). In the Bolivian culture, potatoes are a big part of the diet. When asked to describe their eating patterns, most women stated that they fed their children rice and potatoes in the same meal. The social workers who were interviewed work for the government to help educate indigenous populations on alternative sources of carbohydrates other than just rice and potatoes. These social workers that were interviewed reported that indigenous women are very stubborn and they do not like to change eating patterns that have been passed down over generations, including their love for potatoes and rice.

Fourth, a biological factor that leads to malnutrition includes maternal malnutrition either before or during pregnancy. Lack of food for the pregnant mother means lack of food for the growing fetus. In addition, if a lactating mother is malnourished, it may hinder her ability to effectively nurse her child. For some Bolivian women interviewed, they reported that, many times, they sacrifice eating so that their children can have food to eat. These women stopped producing milk because they were not eating properly and they turned to bottle-feeding.

An environmental factor related to malnutrition may be overcrowding. While conducting interviews in public hospitals and clinics, it was observed that many of the indigenous Bolivian women had at least 10 children. Some of the doctors interviewed reported that there is a lack of education to use methods to prevent further pregnancies. This means that children may grow up in homes where food is scarce and the small amount of food they have must be shared with all their siblings. This presents an area that is open for much improvement, such as hosting sex

educational programs and making contraceptives more readily accessible to impoverished people. However, some barriers against contraception and sex education may arise in a country such as Bolivia, which is predominately Catholic. For example, funding for these types of programs might be difficult to attain.

In addition, a notable environmental factor that leads to malnutrition is the lack of fertile soil for harvesting crops and lack of modern agricultural technology. In Bolivia, much of the soil is very arid because it is surrounded by mountainous terrain. Farmers have a difficult time cultivating crops in the soil and creating sustainable sources of food. In this developing nation, food shortages are also caused by a lack of technology needed for higher yields found in modern agriculture, such as nitrogen fertilizers, pesticides and irrigation (Nordqvist, 2013). These environmental factors lead to significant food shortages. This helps to explain why most children who are malnourished live in the economically depressed northern parts such as Potosi and the Bolivian Chaco and Altiplano of Oruro. The Bolivian Chaco is a vast rural region, semi-arid and semi-humid with a low density of population (CIA, 2014). The Gran Chaco River runs through Bolivia, Argentina, Paraguay, and Northern Argentina and becomes a vast basin in Bolivia once it is surrounded by The Andes Mountains (CIA, 2014). The Gran Chaco River and the soil around it is stone-free and is composed of unconsolidated sandy sediments that are up to 10,000 feet deep in some places (CIA, 2014). Near the Gran Chaco, iodine deficiency is very common because iodine is washed away from the soil surface by snow and heavy rainfall. As a result, some of the most iodine deficient areas are the mountainous areas of the world such as the Bolivian Andes Mountains (Sharma & Atri, 2010). According to the WHO, the daily intake of iodine should be 90 micrograms for preschool children (0-29 months), 120 micrograms for schoolchildren (6-12 years), 150 micrograms for adults (over 12 years), and 200 micrograms for

pregnant and lactating women (Sharma & Atri, 2010). Deficiencies in iodine can lead to brain damage, and physical, neurological, and intellectual deficits (Sharma & Atri, 2010). It is also associated with neonatal and infant mortality and learning disabilities. In severe cases, iodine deficiencies can lead to cretinism, an irreversible form of mental retardation, which typically occurs from fetal period to the third month after birth (Sharma & Atri, 2010).

This presents an area for improvement to implement environmental interventions in order to address child malnutrition. Future programs that help bolster agriculture in Bolivia need to be established. Not only would this provide jobs for people to become farmers, but it would also help decrease the lack of access to foods such as vegetables. Bolivia would benefit from organic fertilizers and irrigation strategies in arid areas such as the Bolivia Chaco where levels of poverty are at higher numbers.

OBJECTIVE TWO: Efforts of CFHI to address child malnutrition in Bolivia.

The current study indicated that CFHI is mainly helping address child malnutrition in indirect ways. Although most people were not familiar in which ways CFHI helps address children malnutrition, professionals who were affiliated with the program remain certain that CFHI helps address educational gaps, a major factor that may contribute to malnutrition. The medical director explained the various ways in which CFHI student volunteers have help educate patients and parents in the waiting room in regards dental hygiene and nutrition. Many times, CFHI students help distribute pamphlets about healthy diets and balanced meals. In addition, some CFHI students pray for the sick patients and help with emotional and spiritual wellness.

Over all, CFHI helps mainly in short term ways more than long term because its student volunteers are only at the clinical sites for one month. Those interviewed indicated that CFHI is

true to their mission and vision of helping strengthen sustainable health care services for underserved communities worldwide. Many of the program fees from CFHI are used to help support local hospitals and clinics and funds are allocated for some healthcare workers from underserved communities. Although the study found that CFHI does not contribute directly by providing material needs to patients such as milk or vitamins, CFHI is helping strengthen health care in impoverished places by partnering with physicians who help educate their patients on health care and nutrition in rural areas. CFHI's contributions are providing an additional source of support for communities that have limited financial resources or access to healthcare.

OBJECTIVE THREE: Resources are available to children with malnutrition in Bolivia and the effectiveness of these previous and current methods used.

There are various resources available to children with malnutrition being funded by local, federal, and international efforts. RUTF packages implemented by the Ministry of Health have helped reduce severe malnutrition. In addition, the Ministry of Health has televised educational programs to promote health habits. Unfortunately, many of the televised efforts that Ministry of Health conducts to help educate people only goes to Bolivians who have electricity or can afford to have a television. According to the World Bank Association, approximately 20% of Bolivians, or 2.8 people, do not have electricity in their homes (World Bank, 2014). In addition, the packages of “Chispitas” (iron supplements supplied by the government) do not contain enough pills to create a consistent intake of iron and reduce anemia in long run. They only reduce anemia immediately, but not permanently. In contrast, the CONAN is doing a good job by helping to redistribute resources for people and holding municipal leaders accountable for

expenses. The CONAN is also reinforcing the morale of medical personnel by providing training campaigns on how to educate people on nutrition.

Lastly, participants from both groups one and two within the study had contrasting views on the “Bono” subsidies such as the Bono Juana Azurduy and governmental interventions. Group one participants were enthusiastic about the programs expressing their gratitude for the money received for getting a free medical check-up. One mother spoke of how much it meant for her to receive this extra income because her husband abandoned her and she could not afford to buy diapers for her newborn. She had consistently tried getting jobs but no one would hire her because she did not have a high school diploma. In contrast, group two complained that a subsidized “Bono” system is ineffective and that the government cannot afford to help everyone with tax money. Group 2 reported an apprehension towards the new government and its political socialistic tendencies.

In December 2005, Bolivians elected “Movement Toward Socialism” leader Evo Morales as president (the first indigenous president of Bolivia) (CIA, 2013). Group two participants reported that they feared that the president will continue to meet his promise to change the country's traditional political class and empower the nation's poor and indigenous majority by using the middle and higher class income taxes. Since taking office, his controversial strategies have exacerbated racial and economic tensions between the Amerindian populations of the Andean west and the non-indigenous communities of the eastern lowlands (CIA, 2013). In December 2009, President Morales won reelection, and his party took control of the legislative branch of the government, which allowed him to continue his process of change (CIA, 2013). Group two participants reported that the subsidized programs he has promoted are ineffective in

the long-run and are providing excuses for Amerindian populations to continue having more children than they can afford because the socialistic government will help them.

With respect to insurance plans offered by the Bolivian government, such as the SUMI (Universal Maternal and Child Insurance), the SNMN (Nacional Maternal and Child Insurance) a subsidized system for pregnant women who cannot work, and the SBS (Basic Health Insurance), there is a wide gap between what resources insurance plans provide and what efforts are needed. Unfortunately, the majority of people who benefit from these insurance plans are mainly the educated high income and middle-income families. Most impoverished people do not have jobs, therefore they cannot get insurance. While people from higher economic classes who were interviewed spoke about the big baskets of food they have received from these insurance plans, the people who need it most are at a disadvantage of receiving any help. They are uneducated; therefore, they cannot get jobs, and therefore they are excluded from receiving insurance.

There are two main problems with the current health insurance (SUMI). First, it does not address the barriers of access to health services in rural areas and for indigenous people. Some of these barriers of access to health services include indigenous people who do not speak Spanish and are not able to communicate with doctors well when they go to their appointments at the clinic. Addressing this cultural barrier to access of health is important in a country like Bolivia, because the indigenous people are a majority. According to statistics, 59% of the Bolivian population is indigenous and poor and suffers from social exclusion (World Bank, 2004). Secondly, the public insurance SUMI has little impact on the supply of health services, which are unequally distributed in the country, leading to problems of limited or no access to people in rural areas (World Bank, 2004). Thus, the current insurance plans have room for much needed

improvement to ensure that health care and food is available to all people as a human right, not a privilege.

Not surprisingly, this study showed how much the impoverished and uneducated people from group one focused on the necessity of short-term relief interventions. They consistently reported their inability to access programs and resources that can help them. One mother explained that she could not access resources easily because she lives in a rural place and does not have enough money to get on more than five buses at a time to get medical attention. She happened to be at the clinic that day because she was able to hitch a ride with a friend. In addition, this group reported that more immediate relief programs should be offered, such as childcare programs and more feeding programs. In contrast, group two focused on long-term relief interventions such as making education mandatory. They focused on long-term efforts such as creating more sustainable sources of farming for people and creating jobs. It is important to find a solution to include both short-term relief efforts that can provide food and vitamins while strengthening long-term relief efforts such as education.

OBJECTIVE FOUR: What can be done in the future to address child malnutrition?

One significant solution to the complex problem of malnutrition would be to strengthen educational reforms in Bolivia. Most women and children living in poverty do not have an educational level past the fifth grade (Samdup & Schutter, 2011). Education reforms should make it mandatory for all children to finish high school. This may require opening new schools in resource poor settings and rural areas. Tremendous funding would be necessary but effective in the long-run. To approach this situation, Bolivia could partner with NGOs such as *Glasswing International*, an independent, non-profit organization based in San Salvador, El Salvador whose

aim is to transform communities in Latin America by leveraging and mobilizing human, financial, and material resources from companies, government, and beneficiaries and encouraging broader societal participation and improving quality of life for children in rural areas by improving their education (Glasswing, 2014). Glasswing International helps provide educational resources for children in rural areas by providing student teachers and volunteers to serve in rural areas. They revitalize existing school infrastructures through “extreme make overs” and create volunteer-led after school programs led by professional staff and volunteers from urban areas (Glass wing, 2014). This is an example of a program that addresses immediate needs of people such as having mentors and tutors, while investing in long-term efforts to improve education in impoverished areas.

Another important long-term suggestion to address child malnutrition would be to create educational programs for mothers that train them in a skill. Many of the impoverished women who were interviewed for this project expressed their strong desire to have stable jobs. The government could partner with NGOs that help provide skills-based education courses such as cooking or culinary school, hair-styling, craftsmanship training, or nurse aide training. This would provide skills for women who are currently uneducated and unemployed to find stable jobs so they are better able to feed and care for their children.

Lastly, the government should help provide affordable daycare centers for women. Many women expressed their concern that they cannot find jobs that will allow them to bring their child with them to work. Since they live in rural areas, they must travel to the city to find jobs such as working as a nanny, where they are not allowed to bring their child. Yet, these women do not have safe environments for their children to stay at home. Creating daycare centers would create jobs for other women while allowing mothers to go to work.

SUGGESTIONS FOR FURTHER RESEARCH

The people who were interviewed were very enthusiastic to answer questions. They were appreciative of the fact that someone wanted to study their opinions. Thus, this study would benefit from being expanded to a larger number of people. While this study focused on individual interviews with 16 people in La Paz and El Alto, a more accurate representation of all of Bolivia would be to include a greater number of participants from other municipalities and regions throughout Bolivia. In addition, follow-up questions should be asked about participants' perceptions on what has been done to address the issue of climate change and agricultural problems in Bolivia, which is causing child malnutrition in Bolivia. This study also could be further expanded by investigating what programs are being offered to other municipalities and regions of Bolivia and how effective these previous and current methods have been.

CONCLUSIONS

One day, my Bolivian host parent told me, "*A little more help from the government, and people will all become dead seagulls.*" This is based on a Bolivian folklore story about generations of seagulls who grew up feeding on left over fish thrown on a deck by a fishing company. For many years, a fishing company would throw away thousands of pounds of fish scraps on a deck. Over many generations, the seagulls learned to feed their young from this fish pile. They never learned how to fish on their own. One day, the fishing company moved away. Although, there were plenty of fish in the water below the dock, the seagulls did not know how to fish on their own. They had never learned to fly over deep waters and fish for themselves, much less they had never taught their young to hunt. The only source of food they were accustomed to was the fish scraps on the deck that the company threw out. These generations of

seagulls soon died and became extinct, despite the fact that the waters below the deck provided plenty of sources for food.

In a similar way, many employed and professional Bolivians fear that the government is becoming more and more socialistic, making people lazy and providing “too many unnecessary resources”. In contrast, impoverished people feel that they do not have enough resources and need additional help. There has to be intermediate point between providing direct short-term aide and creating long-term effective solutions to the problem of malnutrition.

Over the four weeks spent in Bolivia to collect the data it was identified that many doctors have a passion to work with the patients and try to understand their conditions. Their desire to help seemed very genuine. Most doctors working in public hospitals stressed the importance of educating the population on basic hygiene and health to avoid chronic conditions such as severe malnutrition, abscesses, or kidney failure. They played the role of educators, counselors, mothers, fathers, physicians, confidants, therapists, psychologists, and friends for their patients. They sacrifice a lot for their patients, and they love their job. However, many doctors lack the resources to treat their patients effectively at these public hospitals. They need more technical support. The government demands a large time commitment from doctors they employ, but does not provide the proper technical means, such as modern medical equipment for them to be efficient. Recently, the government has increased doctor’s daily hours as a way of “improving health care”, but what good does it do to increase hours if what physicians need are more dialysis machines or syringes that do not have to be boiled to be sterilized? All this points to the fact that malnutrition is a complex issue in which every aspect requires more funding and support, at the professional level and for the patients too.

This study served as a powerful introduction of the complexities of child malnutrition in developing countries. One may be accustomed to reading about local, national, and global health issues. However, seeing first-hand the reality of poverty at the grass-roots level and witnessing the overwhelming lack of resources and education for impoverished people of Bolivia and the lack of resources available for physicians, provided insight into the disconnect between resources available and the effectiveness of programs. This study provides a reminder of the importance of not only addressing malnutrition through long-term interventions, but also ensuring that daily basic needs are met. A balance between both long-term interventions and direct short-term interventions is essential.

APPENDICES

APPENDIX A: James Madison University Institutional Review Board (IRB) Approval



OFFICE OF RESEARCH INTEGRITY

MEMORANDUM

TO: Ms. Eloisa Michelle Amaya Sandoval, Principal Investigator
FROM: Carolyn Strong, Assistant Director *CS*
DATE: June 11, 2013
RE: Human Research Protocol Approval

The addendum request for your Human Subject Research protocol entitled, "*Assessment of Child Malnutrition in Bolivia*" has been approved by James Madison University's Institutional Review Board (IRB). Your research protocol has been assigned the ID Number 14-0011.

As a condition of the IRB approval, your protocol is subject to annual review. Therefore, you are required follow-up with the IRB before your project end date. If you do not plan on continuing your project past the originally approved 1-year approval timeframe, you *must* complete the Close-Out Form. For your convenience, a hard copy is enclosed. If you wish to continue the research past the approved project end date, you *must* submit an Extension Request Form before your project end date to avoid interruption in your research. Please visit our website at the following URL for electronic copies of all forms: <http://www.jmu.edu/researchintegrity/irb/forms/index.shtml>.

You are reminded that any changes in your protocol that affects human subjects must be submitted to the IRB for approval *before* implementing new procedures. This requirement applies to changes in subjects, equipment, procedures, investigators, survey tools, and location of the data collection site. Also, should any adverse events occur during your study, you are required to *immediately* notify Carolyn Strong, Assistant Director. To avoid confusion, please use the assigned protocol number when communicating with the Assistant Director about your project.

Federal Guidelines stipulate that you are required to keep a copy of your approved human subjects' protocol, including the approved informed consent form and site letter of permission, for at least three years after completion of your research. The protocol must be accessible for inspection and copying by authorized representatives of the department or agency supporting or conducting the research at reasonable times and in a reasonable manner. Please let me know if you need additional assistance or further clarification.

From the desk of...
Carolyn Strong, CIM, CRA
Office of Research Integrity
James Madison University
JMAC Building 6, Suite 26, MSC 5738
Harrisonburg, VA 22807

cc: Dr. Maria Wessel, Health Sciences

strongcd@jmu.edu
Phone: 540-568-2318
Fax: 540-568-6240

JAMES MADISON UNIVERSITY
INSTITUTIONAL REVIEW BOARD

ACTION OF THE BOARD

Date: June 3, 2013

ID Number: 14-0011

Title of Study: *Assessment of Child Malnutrition in Bolivia*

Principal Investigator(s): Ms. Eloisa Michelle Amaya Sandoval

The Institutional Review Board took the following action on the human subjects study cited above:

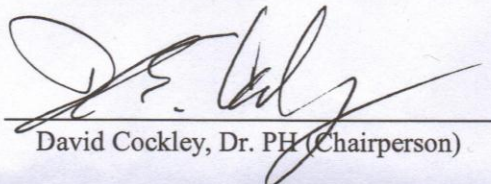
 X Approved

 Disapproved

Approval of the study is for the period from **6/3/2013** through **5/10/2014**.

The Investigator(s) shall immediately bring to the attention of the Institutional Review Board any changes proposed for the approved study as they relate to the care or use of human subjects. The IRB will decide whether the extent or type of changes proposed warrants formal committee review. If such a review is deemed necessary, the chairperson shall schedule the review for the earliest feasible time.

***FOR EXTERNALLY FUNDED PROJECTS, INVESTIGATOR(S) ARE RESPONSIBLE FOR CONVEYING A COPY OF THIS DOCUMENT TO THE OFFICE OF SPONSORED PROGRAMS TO BE FORWARDED TO THE APPROPRIATE FUNDING AGENCY.**


David Cockley, Dr. PH (Chairperson)

6/5/13
Date

***Your Close-Out Form must be submitted within 30 days of the project end date listed above.**

****If you wish to continue your study past the approved project end date above, you must submit an Extension Request Form, along with supporting information.**

Although the IRB office sends reminders, it is ultimately your responsibility to submit the continuing review report in a timely fashion to ensure there is no lapse in IRB approval.

Please return IRB Close-Out Form to the Office of Research Integrity: Campus Mail MSC 5738.

V. APPENDIX B: Interview Questions

Below is sample of the survey questions presented to each participant. All surveys were conducted in Spanish. Below is the translation of the surveys.

Survey/Interview Questions: *English Version*

1. Age
2. Title and/or Profession
3. Gender
4. Describe the eating patterns of low-income families in Bolivia, middle-income families, and high-income families. For example, how often do these families eat, what particular foods do they eat. Do they eat home cooked meals? Do they eat at restaurants?
5. In Bolivia, where do most children who have scarcity of food live? In what regions or towns do they live?
6. According to the World Health Organization, not having enough food to eat can lead to malnutrition or the condition that occurs when the body does not receive enough nutrients or proteins from meat and other sources and food that provides energy. What factors contribute to malnutrition in the children of the regions you stated above? For example, lack of money, lack of transportation, lack of education, lack of land for gardening or farming?
7. Are you familiar with any ways in which CFHI helps combat child malnutrition? If so please elaborate. How often does CFHI provide these services, and how many families benefit from this program?
8. What government programs exist to help address child malnutrition?

- a. What programs does the Department of Bolivian Health offer to address child malnutrition? Do you know of any results? How many people are served and how effective are these programs?
 - b. What programs help offer milk or vitamin supplements to address child malnutrition? Do you know of any results? How many people are served and how effective are these programs?
 - c. Does the government offer programs such as WIC (Women, Infants, and Children) or SNAP (Supplemental Nutrition Assistance Program)? Do you know of any results? How many people are served and how effective are these programs?
 - d. What recourses has the government provided through UNICEF (United Nations Children's Fund) to address child malnutrition? Do you know of any results? How many people are served and how effective are these programs?
9. What are churches doing to help address child malnutrition? Do you know of any results?
How many people are served and how effective are these programs?
10. What are other countries doing to help address child malnutrition? Do you know of any results? How many people are served and how effective are these programs?
11. What are health professionals doing to help address child malnutrition? What type of advice or programs do health professionals offer to help address this issue? Do you know of any results? How many people are advised and how effective is this approach?
12. What are other solutions to address child malnutrition in Bolivia? What other services or NGOs could established to help combat child malnutrition?

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